

Space News ROUNDUP!

VOL. 36 NO. 18

Lyndon B. Johnson Space Center, Houston, Texas

June 20, 1997

In this issue



A crew of seven will set a record next month for the quickest return to space.

Page 2



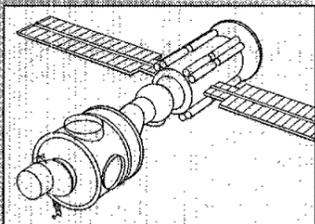
Blood drive committee wins public service award for outstanding efforts.

Page 3



The X-38 prototype spacecraft travels to California for its first flight tests.

Page 4



Astronauts gear up to train for space station assembly flights.

Page 5



Manned Spacecraft Center welcomes visitors for the first time 33 years ago.

Page 6



Secretary earns top honors; employees enjoy STS-84 launch.

Page 7



JSC Photo 97E01783 by Robert Markowitz

Astronaut Jerry Linenger and his STS-84 crew mates take time out during a briefing at Space Center Houston to autograph photos for visitors. Commander Charlie Precourt, Pilot Eileen Collins, and Mission Specialists Ed Lu, Jean-François Clervoy and Carlos Noriega joined Linenger at Space Center Houston to talk about the sixth shuttle mission to dock with the Russian Mir Space Station. Linenger returned to Earth after spending more than four months on the station. Astronaut Mike Foale replaced Linenger on the Russian outpost and will return to Earth in September.

Astronauts change space operations jobs at JSC, KSC

Astronaut Don McMonagle will become manager for space shuttle launch integration at Kennedy Space Center, replacing Loren Shriver after the STS-85 mission.

The announcement by Space Shuttle Program Manager Tommy Holloway followed the appointment of Shriver last week to the staff of KSC Director Roy Bridges as deputy director for launch and payload processing.

McMonagle will begin the transition to his new position immediately. He will be responsible for final shuttle preparation, mission execution and return of the orbiter to KSC following landings at Edwards Air Force Base, Calif.

As the first manager of the then-newly

formed directorate-level position of manager, Extravehicular Activity Projects Office, McMonagle was responsible for overseeing the development of all space walk requirements, techniques and tasks for shuttle-based missions as well as assembly and operation of the International Space Station.

Astronaut Greg Harbaugh has been named acting manager of the Extravehicular Activity Projects Office, replacing McMonagle. That appointment by JSC Director George Abbey is effective immediately to allow a smooth transition between the two prior to McMonagle's move to KSC.

Please see **SHRIVER**, Page 8

Columbia passes reflight milestone

NASA's Space Shuttle Program passed a major milestone this month on its way to reflighting the orbiter *Columbia* and the first reflight of the same payload and crew in shuttle history.

Suspicious readings from one of *Columbia's* fuel cells compelled NASA managers to cut the STS-83 mission short after only four days in space, marking only the third time in shuttle history that a mission was curtailed for mechanical reasons.

Since the return of *Columbia* following the shortened STS-83 mission, the suspect fuel cell has undergone extensive analysis. The conclusion is that an undetermined and isolated incident caused a slight change in the voltage of about one-fourth of the 96 cells that make up each fuel cell.

To ensure the health of the fuel cells pre-launch, the power plants will be started earlier than usual to allow for additional monitoring before liftoff. Also, the program is reviewing the possibility of installing new fuel cell performance monitors that will indicate individual cell "health" rather than a single monitor for each of three 32-cell substacks.

This will provide additional insight into pinpointing large voltage shifts in a single cell, which could indicate a potential problem, or a small voltage shift in a number of cells, which is a benign situation. Presently, the per-

Please see **KSC**, Page 8

Linenger reflects on mission

Mir stint enjoyable, challenging

By James Hartsfield

Astronaut Jerry Linenger reported a new global familiarity with the planet Earth along with a heightened appreciation for his own backyard following his four-month stay aboard the Russian Mir Space Station.

Linenger, back on Earth for fewer than three weeks following his return aboard *Atlantis* on STS-84, spoke to reporters during a June 13 press conference at JSC.

"It was a great adventure and it is something that I am very glad that I participated in," Linenger said of his long-duration mission. "The time on the station was probably more challenging than I expected but when you are busy, and they are important things that you are doing, the days do fly by. I never felt a strain of isolation or some other things that I might have anticipated."

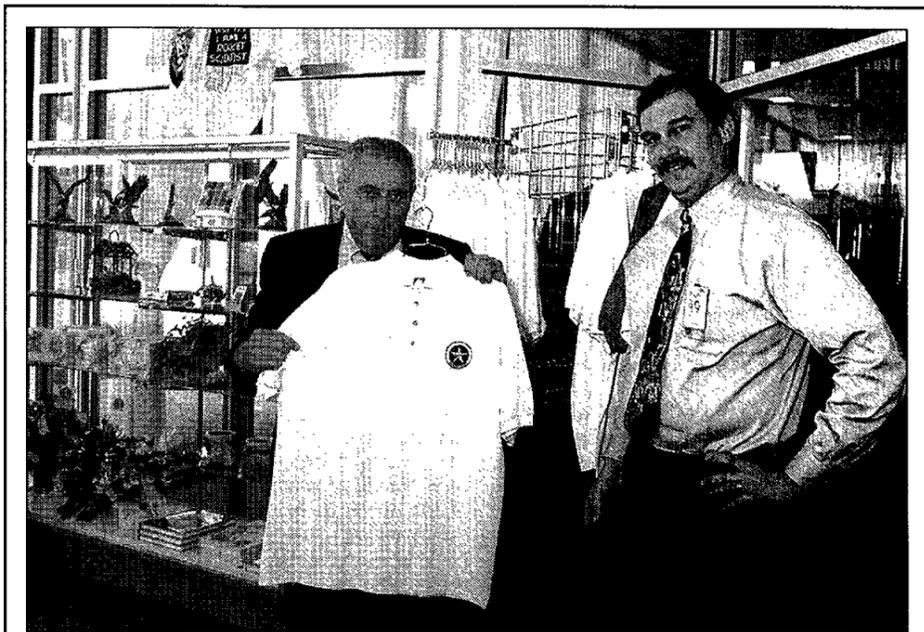
Linenger and his cosmonaut crew mates encountered several problems, including a fire in an oxygen-generation system, leaks of coolant onboard and other mechanical troubles.

"Fixing equipment that malfunctions, repairing cooling loops and things like that, you know you have enough time to deal with those problems and you just methodically work with them," he said. "Things like the fire... those get your pulse up. But I would say... that there was no panic. You need to calm yourself down and attack the things that are at hand. You know, I slept at night. I wasn't up at night biting my fingernails. However, the next day, something else would go a little wrong and you had to work on another system."

Meanwhile, Astronaut Mike Foale wrapped up the first month of his planned four-month stay on the station in a week highlighted by the completion of repairs to a key cooling loop, while moving ahead with his agenda of on-orbit science. Foale said he's finding life on board Mir comfortable due to the absence of gravity.

"Mir is comfortable," Foale said, "mostly because you're in zero gravity and when you sleep, in particular, that's when I really appreciate the comfort. You just float in a slightly fetal-like position but in a sleeping bag that surrounds you. I've been sleeping better than I have done for years. As far as living conditions, eating and drinking, we have all the facilities and amenities here and it's pleasant. It's better than most camping trips if you would want to compare it with something."

Please see **LINENGER**, Page 2



JSC Photo S97-07395 by Steve Candler

GRAND OPENING—JSC Director George Abbey displays one of the new shirts available at the Bldg. 3 Exchange Store with the help of Karl Schuler, chairman of the retail team that helped develop the inventory of new items and services available at the gift shop. Both stores have expanded their inventory to offer employees a wide range services including film processing. Grand opening activities conclude today.

Wakata gets station assembly flight seat

Japanese astronaut to operate remote manipulator system robot arm

Japanese Astronaut Koichi Wakata will fly on STS-92, the third space shuttle mission to assemble the International Space Station, set for a January 1999 launch on *Atlantis*.

Wakata's assignment to the mission was announced by NASA Administrator Daniel S. Goldin and Japanese Science and Technology Agency Minister Riichiro Chikaoka, in Tokyo, Japan this month.

"NASA is honored to have Mr. Wakata participate in such an early and significant space station

assembly mission," Goldin said. "His participation on this flight is symbolic of the close bond that has developed between the American and Japanese space programs, and the extent to which we rely upon one another to meet our mutual objectives in space."

Wakata was selected as an astronaut in 1992 and has one previous space flight to his credit. He flew as a mission specialist on STS-72 in January 1996 aboard *Endeavour*. During that flight, the crew retrieved the orbiting Space

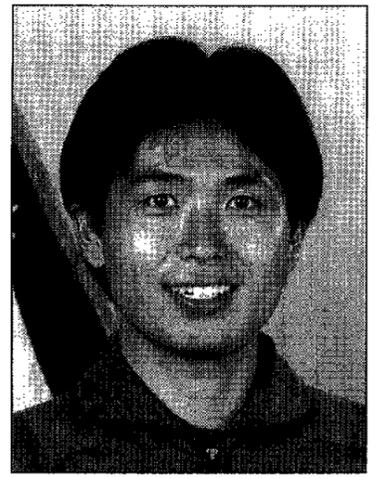
Flyer Unit satellite which was launched from Japan 10 months earlier, and deployed and retrieved the OAST-Flyer satellite.

On STS-92, he will be the primary operator of the shuttle's Remote Manipulator System robot arm supporting space station assembly tasks to be performed during four scheduled space walks. STS-92 is the fifth in a series of American and Russian assembly flights which will begin with the launch of the Functional Cargo Block in June 1998.

Prior to the arrival of *Atlantis* and the STS-92 crew, space station elements already delivered to orbit will include the Functional Cargo Block; Node 1 and two Pressurized Mating Adapters; the Service Module; and various logistical cargoes that will be carried aboard the second shuttle assembly mission in December 1998.

The remaining crew members will be named at a later date.

For information on the International Space Station, visit URL: <http://station.nasa.gov>



Koichi Wakata

Fly-back rocket booster under study

NASA has awarded contracts for \$1 million each to Lockheed Martin and the Boeing Co. to study a possible future upgrade in which the rocket boosters that power the shuttle would fly back to the launch site.

To complement its in-house examination, Marshall Space Flight Center is asking each of the contractors for an in-depth concept definition on the liquid fly-back booster.

Proposals from industry will provide data and configuration studies for both the booster and its engine, focusing on the liquid fly-back booster concept—including analysis and evaluation model fabrication and wind-tunnel testing.

If the concept is implemented, the unpowered, liquid fly-back boosters would become the first-stage boosters of the space shuttle system.

Under the systems integration concept being studied, a shuttle launch using the upgraded booster would appear similar to the current system to an observer on the ground.

After separation from the shuttle, however, the two booster rockets would begin coasting for nine minutes, rather than parachuting into the ocean. Then jet engines would be started, and the unpowered boosters would fly back and land at KSC.

Other elements of the present shuttle system—including the orbiter, main engines and external tank—would remain essentially unchanged if the new boosters are incorporated.



NASA Photo 97-E-822

Members of the STS-94 flight crew take a break in the white room at Launch Pad 39A during STS-83 Terminal Countdown Demonstration Test. The crew did not have to repeat the test for the STS-94 refight. Standing from left are Payload Specialist Greg Linteris, Pilot Susan Stills, Commander Jim Halsell, Mission Specialist Mike Gernhardt, Payload Specialist Roger Crouch and Mission Specialist Don Thomas. Kneeling is Payload Commander Janice Voss.

Columbia gets new tiles prior to July launch

By Kyle Herring

Space Shuttle Program officials were scheduled to meet yesterday to select the official launch date for *Columbia's* reflight of the Microgravity Science Laboratory with only minor outstanding work remaining in the processing flow that could affect the schedule.

If all remains on schedule, the target launch date is July 1 with a 1:37 p.m. CDT liftoff at the opening of a two and a half hour launch window. Just after sunrise July 17 under this schedule, *Columbia* would land.

Vehicle Engineering Office experts continued to evaluate thermal protection system tiles on the forward reaction control system that have shown subsurface cracking attributed to the routine inspections of engine nozzles for each of the thruster jets around which the tiles are located.

While it is unknown how long the cracks have been there, managers said it was prudent to exchange those tiles for heavier ones that

can withstand the forces of the nozzle inspections that are suspected of causing the tiny cracks. Since the only way to determine if the tiles exhibit the cracking is by removing adjacent tiles, as many as 44 are being removed and replaced prior to launch. The other orbiters also are being inspected and tiles being replaced around the forward jets prior to their next flights.

The tile replacement work continued through the middle of this week before the pad was cleared for propellant loading. The remaining work on the tiles was to be addressed at yesterday's flight readiness review.

The reflight also will mark the fastest turnaround for a crew. Commander Jim Halsell, Pilot Susan Stills, Mission Specialist Janice Voss, Mike Gernhardt and Don Thomas, and Payload Specialists Roger Crouch and Greg Linteris will break the 128 day flight-to-flight record of Steve Nagel on STS-51G and STS-61A in 1985.



Linenger: 'Biggest joy is conducting good experiments'

(Continued from Page 1)

Foale's Mir 23 crew mates, Commander Vasily Tsibliev and Flight Engineer Alexander Lazutkin are in the 124th day of their six-month mission. Tsibliev, Lazutkin and Foale completed repairs to a leaky cooling loop in Mir's Kvant-1 module last week. A cracked section that runs along the inner hull of the module was removed and replaced. The loop was reactivated and is now working normally.

With that repair complete, the trio was able to set up the new Elektron oxygen-generating unit delivered to Mir by *Atlantis* last month. Installation was scheduled to be complete this week. The new unit will serve as a backup to the Elektron now working in Kvant-2.

Foale said he also has been busy with scientific research, particularly the fundamental biology experiment in which he's attempting to grow three generations of mustard plants

from one set of seeds. The ability to grow plants on orbit, as a source of food and oxygen, could be vital for sustaining life on future space stations and during interplanetary space flights.

The experiment work performed by Linenger, a medical doctor, included studies of sleep, physiology and photographic observations of the Earth, scientific work that he found among the most fulfilling aspects of his flight. He reported taking more than 10,000 photos of Earth during his 121 days in orbit.

"I've noticed that when I go by and see a map on the wall now, my mind flashes to a picture of what I had seen out the window," Linenger explained. "For example, when I see a map and I see the St. Lawrence Seaway, I can snap very quickly to the view out the window. I can see the ice flows and the break-up of those ice flows and almost run a film

through my mind. I feel like I know the Earth very well."

Physically, Linenger said his readaptation to Earth's gravity is going well, and he is using a variety of exercises, with swimming as a primary low-impact activity.

"It was much less difficult than I anticipated. For my rehab... the water felt like jello the first three days, like mercury the next few days, and now it is starting to feel like water again," he said. "I feel very much reacquainted. I feel very normal. On the other hand, when you look at the medical tests I do have some bone loss. I do have some muscle strength deficits, and being a physician and a sports medicine physician in particular, I realize you have to be very cautious until you get your strength back up."

Linenger said there are things he will miss about the Mir, and his experiment work will

likely be high among them. "One of the biggest joys is conducting good experiments. I felt much more like a scientist than I did during shuttle flights when you have someone always looking over your shoulder," he said. The camaraderie and sense of accomplishment a crew experiences as they work through problems aboard the station also was very satisfying, Linenger added.

But after a quarter of a year in orbit, the simplest things on Earth can become the most appealing.

"What I found as pleasurable as anything is the first morning back, I went out in my backyard, grabbed a bucket and started trimming my bushes and gardening," Linenger said. "Just watching cardinals fly by and just doing some basic things that we all take for granted, I was in heaven in my backyard with all the green and the flowers and the trees."

Green, edible aircraft anti-icing fluid saves environment

Combining increased efficiency with environmental safety, a NASA-developed fluid promises to make flying safer without introducing dangerous chemicals into the environment and may reduce corrosion on cars.

A three-engineer team at NASA's Ames Research Center designed the non-toxic fluid to keep ice from building up on airplanes. It is so environmentally safe that it has been referred to as "food grade," because the ingredients used in its creation have been approved by the Food and Drug Administration for use in food. When used in bulk, the NASA de-icer poses significantly less of an environmental hazard than chemicals currently in use.

"The new fluid also can increase flight safe-

ty, in keeping with one of NASA's major goals," fluid co-inventor Leonard Haslim of Ames said. "The food grade anti-icing fluid not only works as well as, or better than available fluids, but it is the only one that is non-toxic and totally biodegradable."

The invention also may save money now being spent to meet the Clean Water Act, he added. "The fluid can be put on runways, bridges, ships and automobiles, as well."

"When you look at the high costs of rust and other salt damage to cars, bridges, roads and the environment, it's obvious that using this new anti-icing fluid can save a lot of money," Haslim said. "You can even spray the stuff on your windshield the night before you go to work, and the next morning, the

wiper blades will easily push the ice completely off the glass," he added.

Anti-icing fluids used today can sicken or kill water life, animals and humans due to ingredients such as ethylene glycol and additives. The new fluid contains propylene glycol that may be food grade, according to co-inventor, John Zuk, also of Ames.

Worldwide, about a half a billion gallons of aircraft de-icing fluid are used annually. Much of it could be replaced by the new non-toxic fluid, according to Haslim.

The anti-icing fluid will "grab" onto an airplane's surface better than current fluids when a plane is at rest. "Our new fluid produces a long-lasting barrier to ice build-up. But when the plane takes off, the fluid suddenly gets

thinner, and it blows away so the wings are clean and have plenty of 'lift' force as the plane rises," explained Robert Lockyer, the third co-inventor on the Ames team.

"I compare the green-colored fluid to lime sherbet when it's on the wing and limeade when the plane is moving," said Haslim.

The new fluid is neutral, neither an acid nor a base, and is non-conductive. It appears to be harmless to aircraft, pavement, bridges and vehicles, according to Haslim. "It shouldn't hurt plants, either," he said.

The Ames fluid is now under test by government and industry for aircraft use. Comparison tests will be run against corrosive de-icing salts as well as other de-icing materials, such as calcium magnesium acetate.

Community News

JSC again opens doors to public

Open house set for Saturday, August 23

By Jovan-Justine Love

JSC will open its doors to the public once again from 9 a.m.-4 p.m. Saturday, Aug. 23 for its annual open house event.

This is a day when NASA's laboratories, training facilities and Mission Control Center are opened to welcome the Houston community behind the scenes of the nation's space program. The JSC open house is free and gives the public a much closer look at NASA's programs and operations.

The first JSC open house was held in 1964 with more than 52,000 visitors (see page 6). In more recent times, August 1995, the open house had more than 70,000 visitors. And in spite of the rainy weather, last year's event still hosted approximately 20,000 visitors.

"Our people are the best ambassadors for the space program," said JSC Director George Abbey. "Their enthusiasm and dedication combined with JSC's impressive facilities and exciting programs really get our story across to the public. We look forward to this year's open house being the best ever."

The open house planning committee, including organizational representatives from across the center, already is at work arranging this year's event and will be needing many volunteers—come rain or shine. Volunteers will be needed to set-up and manage booths, staff exhibits, greet the public, hand out literature, act as tour guides, work with children, clean up and for a variety of other logistics.

Employees can volunteer for the open house through their directorate planning committee representative. Additional information on the JSC Open House will appear in upcoming Space News Roundup articles.

Correction

The June 6 issue of the Space News Roundup incorrectly spelled the name of Mary Wylie on the photo caption on page 10. In addition, the proposal occurred in the Bldg. 11 cafeteria, not Bldg. 3.

Employees' children earn NASA, JSC scholarships

A child of a JSC employee has earned a JSC Exchange Scholarship for 1997. Five other students, children of employees at other NASA centers, earned this year's NASA College Scholarships.

This winner of this year's JSC award was Selina Mareie Marquez, daughter of Rosemarie Marquez of the Safety Reliability and Quality Assurance Office at White Sands Missile Range.

Marquez attended Las Cruces High School and graduated in May. She currently attends New Mexico State University and will major in chemistry or biology. She is a member of the National Honor Society.

Marquez will receive \$4,000—up to \$1,000 a year—toward tuition at the university of her choice. Selection was based on overall scholastic achievements, extent of financial need and breadth and substance of school and community activities.

This year's winners of the NASA College Scholarship Fund were Virginia Ann Miller, Laila Hlass, and

Christine Andres from Stennis Space Center; Ron Alterovitz from Lewis Research Center; and Sucharit Suresh Joshi from Langley Research Center.

The NASA College Scholarship Fund Inc., board of directors has determined that five scholarships will be awarded again next year. Each scholarship will be renewable annually for a maximum of \$8,000 over six calendar years.

The Scholarship Fund was established to award scholarships agencywide to qualified dependents of NASA and former NASA employees. The fund was established as a direct result of a substantial gift by the noted Pulitzer Prize winning author, James A. Michener. Many NASA employees have contributed to the fund directly or through the Combined Federal Campaign. Other major contributors include the Freedom Forum (to honor the Hubble crew members in 1994 and again in 1996 to honor Shannon Lucid) and the JSC Chapter of the NASA Alumni League.



St. Luke's employees and JSC blood drive committee members use gallon milk containers to portray the volume of blood JSC collected at the record-setting drive last October when they drew 506 pints, or 63 gallons, of blood. From left are Craig Valiare, Carla Guidry, Rebecca Joseph, Bill Stockton, Tammy Harris, Marty Demaret, Jay Voss, Amy Mendez, Truda Carlblom, Richard Schmidgall, Patricia Hines, Richard Delgado, Becky Derbonne, Stephanie Logsdon, Jannette Jackson and Dan Mangieri.

June blood drive nets 309 donations

Blood drive committee wins public service award

JSC's blood drives continue to bring in record-setting donations, and committee members were recognized recently for their efforts in increasing the community's blood supply.

Dan Mangieri, co-chairman of the Blood Drive Committee accepted the Wally Grimes Public Service Award on behalf of all the committee members at the Public Service Recognition ceremony sponsored by the Federal Executive Board last month.

"We have a great group of folks here at JSC, both the committee members and the donors. They have really come through for the community," Mangieri said. "There is no substitute for human blood, and a sufficient, safe supply is vital to the well-being of Houston and our surrounding communities."

As a part of JSC's philosophy of "giving back to the community," in February 1996, the center decided to initiate an effort to boost participation in its Onsite Blood Drive Program. The Human Resources Office spearheaded the effort by surveying prior blood donors to determine what program changes were necessary to increase donor participation, and by forming the Blood Drive Committee to respond to needs identified through the survey. Feedback from the survey indicated that convenience was a major factor for donors because it was difficult for employees to break away from the office to give blood with increasing workloads.

The committee responded by moving the blood drive from the Gilruth to Teague

Auditorium, and expanding blood drive hours, including keeping it open during lunch. The blood drive committee also formed a publicity team that helped get the word out prior to blood drives using announcements at staff meetings, electronic mail notices, posters, banners, news articles and initiation of special promotions. In addition, senior managers have set an example by turning out to donate blood.

"The results of the Blood Drive Committee's efforts paid off in a big way," Mangieri said. The first blood drive after the initiative resulted in more than 300 donors—almost six times the turnout from the previous drive. In the first four drives since redesigning the program, JSC netted a total of 1,503 blood donations. Last October's drive alone turned out a record 506 donors. More recently, this month's blood drive netted 309 donations.

Results from a recent benchmarking exercise at JSC, show the center has become a leader among corporate sponsors of blood drives in the Houston area. The timeliness of JSC blood drives also has helped to bolster blood supplies, particularly during holiday shortages.

Committee members said JSC has stepped up to its responsibility to generously give something back to its community. St. Luke's Episcopal Hospital said the successful blood drives could not have been accomplished without the extraordinary efforts of the Blood Drive Committee.

Teachers come back to school

By Billie Deason

The chalk dust had barely settled from the busy school year when teachers began arriving at JSC for a series of seven professional development workshops.

Taking a busman's holiday, teachers from around the world will spend time going back to school this summer at JSC.

With a focus on JSC's unique mission in human space flight and using JSC technical experts, teacher participants will learn how the science, mathematics and technology of the space program can cross the curriculum in the subjects they teach.

The JSC teacher workshops are designed to expand the participants' aerospace knowledge, teach ways to use aerospace topics in the classroom, enhance the teachers' knowledge of new technology and enable the teacher participants to learn about specific NASA projects directly from the scientists and engineers working in the agency's programs.

A "Friends and Family" workshop will host 22 kindergarten through 12th grade teachers who are family members or close friends of civil services and contractor employees.

Teams of Clear Creek ISD intermediate teachers representing several disciplines will focus on the International Space Station Program and using technology in the classroom.

Ten teams of middle school teachers will participate in activities about the exploration of Mars, and robotic and human missions. The workshop runs for 13 days, with a three-day follow-up session at JSC in the fall and two days at each of the teacher's schools in the spring of 1998.

For the fourteenth consecutive year, 25 teachers from Department of State overseas schools will travel from around the world to JSC for a general aerospace workshop.

JSC will host 25 elementary school teachers from 11 states for the NASA Education Workshop for Elementary School Teachers. This Headquarters-funded program selected teachers through a nationwide competitive process.

Teams of middle school teachers from Colorado, Kansas, Nebraska, New Mexico, Oklahoma, Texas and South Dakota will spend three weeks at JSC in the International Space Station Program Life Sciences Workshop. This workshop leads the teacher teams in developing a classroom investigation for their students to conduct over the coming school year, with the students' findings being shared among the classes over the Internet. The JSC workshops began June 4 and continue through Aug. 8.

Employees can improve speaking skills easily

JSC employees have the opportunity to improve their speaking skills.

Several groups meet Wednesdays around the Clear Lake and welcome new members. The Clear Lake Communicators meet at 11:30 a.m. at the Lockheed Martin, 555 Forge River Road. The Spaceteam Toastmasters meet at 11:30 a.m. at United Space Alliance, 600 Gemini. The Spaceland Toastmasters meet at 7 a.m. at the House of Prayer Lutheran Church. For more information on these or other clubs, check out the Dates and Data column on Page 7.

JSC Safety Alert

Overhead task light hazard

What Happened

A new task light had an electrical short during a functional test in the Building 337 warehouse. The task lights are meant to be mounted underneath the overhead shelf of modular furniture work stations located in most JSC offices.

Outcome of the Investigation

The task light, manufactured by Heritage Supply Inc., was taken apart, and damage to the wiring was discovered. The installation holes were drilled directly above the electrical wires, fraying them in the process. Due to possibly damaged wires in other task lights, the potential exists for a possible shock hazard.

What You Can Do

There are 422 of these task lights in use at JSC and Ellington Field. They have the following features that distinguish them from others: a double bulb; white housing casing; an outlet near the on/off switch and a black cord on the right side of the light.

Check the task light mounted under bookcases or computer hutches in your area immediately. If they meet the description above, do not use them. Report item to Betsy Hodges at x 38113 or Ruby McDade at x36659 and give name, building, room number and the number of task lights in use.

When all of the lights are located, Center Operations Directorate will conduct inspections with the manufacturer to correct any problems.

X-38 Begins Flight Testing

By Karen Schmidt

For the first time in 20 years, JSC engineers rolled out a prototype of a new spacecraft that could be the predecessor for the next century's regular mode of human transportation into space.

The JSC Advanced Development Office reached a turning point this month when the first X-38 test vehicle left Bldg. 220 enroute to Dryden Flight Research Center for its first series of flight tests. With the shipment of vehicle 131 to the California coast, the combined JSC/Dryden team will be able to collect valuable aerodynamic data.

"Beginning full-scale flight tests is a big milestone for us that the team has been looking forward to with a lot of excitement," said X-38 Project Manager John Muratore. "No one has ever done anything like this—deploying a parafoil from a lifting body and flying a lifting body with an all electric flight control system—before, and there are unknowns. We expect surprises. But we have done a lot of work to minimize the unknowns and we are confident this vehicle can perform well."

Vehicle 131 will begin tests in July at Dryden with "captive carry" flights, during which the vehicle will remain attached to a NASA B-52 aircraft—the same B-52 that carried the X-15 research aircraft in the 1960s.

"The captive carry tests will verify the vehicle's flutter and structural loads margins for the flight test envelope, as well as allow us to

evaluate the operation of 131's systems in the flight environment and verify our software and procedures for the free-flight tests," said John Hooper, X-38 Deputy Project Manager for Systems Engineering.

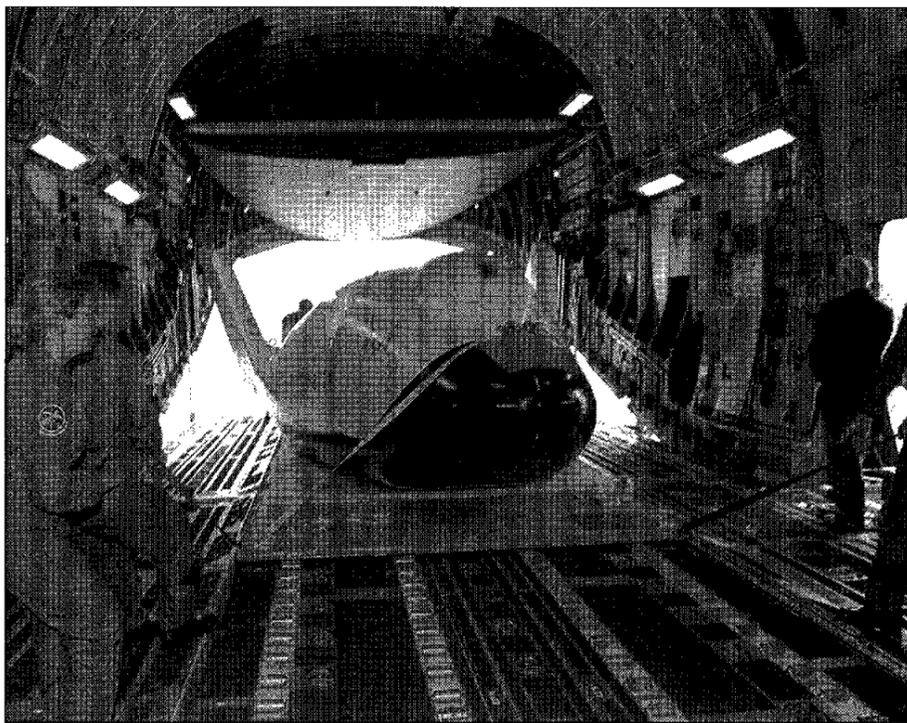
In early September, 131 will begin a series of drop tests, with release points at altitudes of 25,000 to 50,000 feet. After a short free-flight period, the vehicle will deploy the parafoil and glide to the landing site. Hooper said the parafoil itself was a challenge to design and build.

The early parafoil development was performed by NASA's Marshall Space Flight Center in a program that started in the late 1980s, followed by a U.S. Army program in the early 1990s. Hooper said early X-38 project parafoil flights experienced a series of problems with the parafoil, and after consulting the sport parachute industry and experts from labs across the country, the JSC team established a series of design modifications to improve the parafoil's deployment, inflation and flight characteristics.

"The parafoil testing has been performed at the Army's Yuma Proving Ground in Arizona," Hooper said. "The Yuma testing began with drop tests of the parafoil on an Army air drop pallet, and have progressed to testing with an X-38 skeletal model, we call the 'doghouse.'"

The "doghouse" tests allow the parafoil to be deployed in a manner that simulates the vehicle 131 deployment sequence.

"Vehicle 131 does not have an active flight control system so its



A U. S. Air Force flight crew loads the X-38 prototype spacecraft, designated vehicle 131, into a C-117 for shipment to Dryden Flight Research Center. In California, the vehicle and team members will be put through a series of tests to collect valuable aerodynamic data.

JSC Photos by Hector Gongora, Benny Benavides

JSC Photo S97-06990

rudder and body flaps are in fixed positions," Hooper said. "This will restrict the vehicle's free flight time but will allow us to verify the parafoil deployment sequence from the vehicle and to evaluate the transition from lifting body flight to parafoil flight."

Simulations of flight operations also were conducted to prepare the team for the Dryden tests. Team members participated in classroom training, aircraft flights and mission simulations to give personnel in the B-52 a feel for actual flight tests. As a group the team conducted more than 22 flight simulations for each of the positions on the flight team.

"The X-38 project was started with a small team doing feasibility studies in late 1994," Hooper said. "The project got a 'go' in the spring of 1995, expanded the team and moved into Bldg. 361. The contract for the fabrication of the 131 airframe was awarded to Scaled Composites in February 1996 and the vehicle was delivered in September 1996."

At JSC, the vehicle went through

structural testing and system installation and checkout from September 1996 through May 1997.

Following the tests of 131 this summer, a second vehicle with an active flight control system—vehicle 132—will be tested at Dryden in the late 1997, early 1998 time frame, Hooper said. The 132 airframe, also constructed by Scaled Composites, was received at JSC in December and is currently undergoing wiring and subsystem installation in Bldg. 220.

"The active flight control will allow longer free flight times compared to 131," Hooper said. "Design and fabrication of the first space-flight capable vehicle, vehicle 201, also has begun with assembly to take place at JSC in Bldg. 220. The 201 vehicle will be carried into earth orbit by the shuttle for a space flight test in the 2000 time frame."

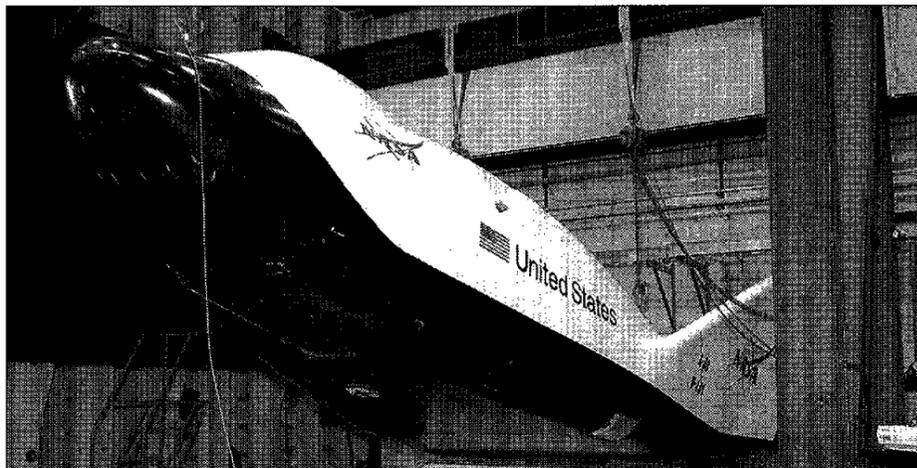
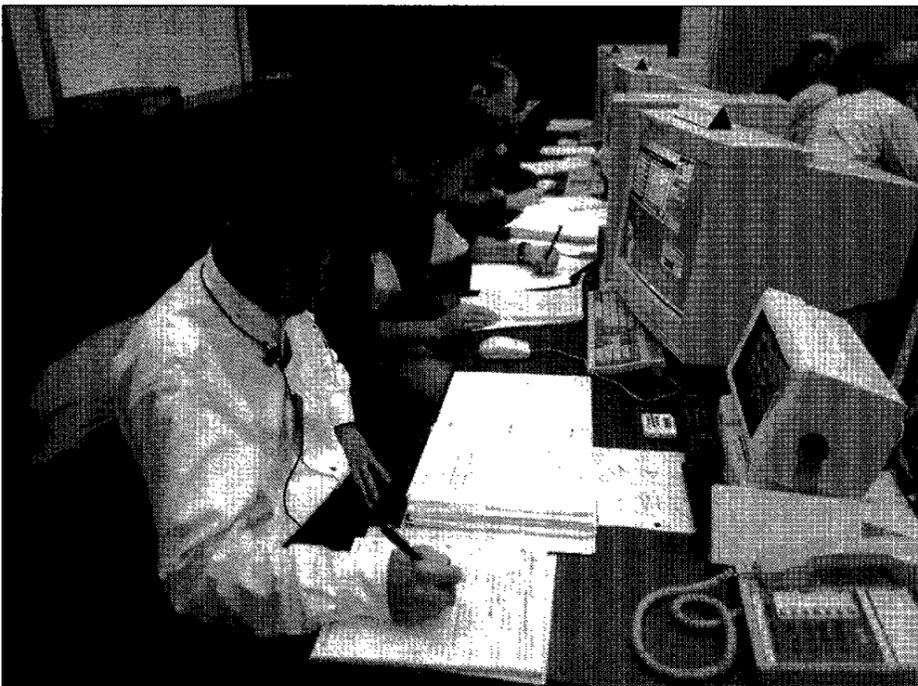
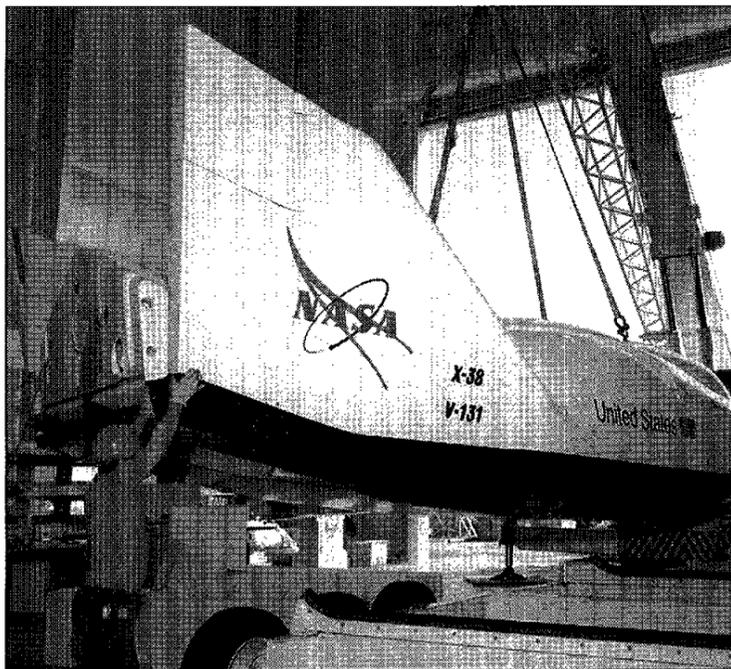
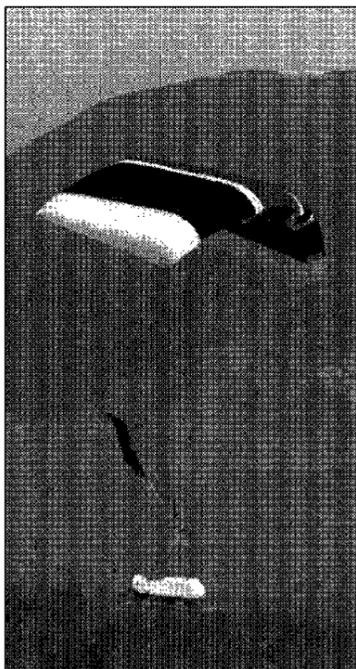
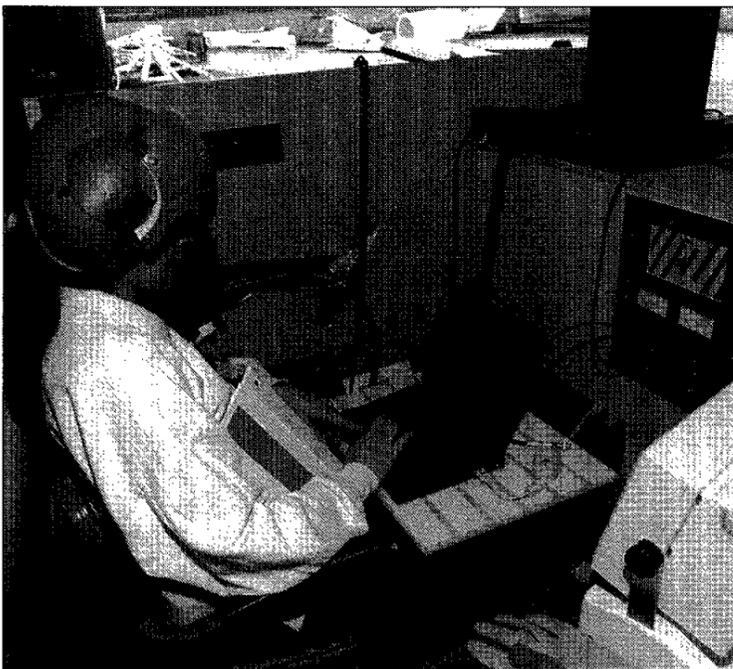
Once testing is complete, designs and lessons learned will be the foundation for an International Space Station "lifeboat," and the first new human space craft to travel into

space in more than 20 years.

"With the data and lessons learned we gather from these flight tests, we can prepare vehicle 201 for space flight and from there provide space station crew members with a reliable emergency vehicle in space," Hooper said.

The goal of the Advanced Development Office is to develop the vehicle taking advantage of already available equipment and technology for as much as 80 percent of the design.

"Using available technology and off-the-shelf equipment can significantly reduce cost," Muratore said. "The original estimates to build a capsule-type crew return vehicle several years ago amounted to more than \$2 billion in total development cost. The X-38 team will build and test two prototype spacecraft for \$90 million, and we believe we can provide four operational crew return vehicles that are more capable and versatile than earlier designs, for less than a quarter of the original estimates." □



JSC Photo 97-06181, U.S. Air Force photo 68, JSC Photos 97-06962, 97-06197 and 97-06961

From top to bottom, left to right: 1) Merri Sanchez, X-38 team member, conducts simulations at the B-52 launch panel in preparation for testing at Dryden. 2) The X-38 skeletal model, known as the "doghouse," makes a drop test over the Arizona desert so the team can collect deployment data for Vehicle 131. 3) JSC employees load vehicle 131 for shipment to JSC Ellington Field. 4) Team members participate in a simulation of X-38 flight test activities in the payload operations center. From left are Jeff Fox, Mark McDonald and Jon Muratore. 5) Before being shipped Vehicle 131 is weighed and its center of gravity measured at JSC.

Astronauts begin training for station assembly

Leestma: 'It is important for us to begin work now to train the EVA crews who will support space station assembly flights.'

By Eileen Hawley

Acadre of 14 space shuttle astronauts has begun intensive training in preparation for the space walks required for on-orbit construction of the International Space Station.

Beginning in July 1998 on STS-88 and continuing through August 1999 on STS-100, astronauts will begin on-orbit construction of the space station over the course of 18 planned space walks.

Jerry Ross and James Newman were previously assigned space walking duties as members of the STS-88 crew in August 1996. Training will now expand to include Leroy Chiao, Robert Curbeam, Mike Gernhardt, Canadian Astronaut Chris Hadfield, Tom Jones, Mark Lee, Michael Lopez-Alegria, Bill McArthur, Carlos Noriega, James Reilly, Joe Tanner and Jeff Wisoff.

"It is important for us to begin work now to train the EVA crews who will support space station assembly flights," said Dave Leestma, director of Flight Crew Operations. "These crew members will be exceptionally busy preparing for some challenging and demanding tasks, from initial assembly tasks through installation of the robotic arm and an airlock for station-based EVAs. We expect that these assignments may be refined in the future, with additional assignments as mission requirements dictate."

American assembly flights for the International Space Station will begin with STS-88/ISS-2A, scheduled for a July 1998 launch. That mission will be highlighted by two space walks, and the mating of the U.S.-built Node 1 station element to the Functional Cargo Block, which already will be in orbit. During their space walks, Ross and Newman will connect power and data transmission cables between the Node and the Functional Cargo Block. The Functional Cargo Block, which was built for the U.S. by the Russian Space Agency, is scheduled for launch on a Russian Proton rocket from the Baikonur Cosmodrome in Kazakhstan in June 1998.

Node 1 will be the first station hardware delivered by the space shuttle. It has two

Pressurized Mating Adapters, one attached to either end. One Pressurized Mating Adapter is permanently mated to the Functional Cargo Block and the other used for orbiter dockings and crew access to the station.

In January 1999, Chiao, Wisoff, McArthur and Lopez-Alegria will conduct four space walks during the course of the STS-92/ISS-3A mission. Building on previous American and Russian assembly flights, STS-92 will carry the first of several integrated truss structures for the International Space Station. Integrated Truss Structure Z1 will be attached to Node 1 and will allow the temporary installation of the first U.S. solar arrays, called the P6 Photovoltaic module. The Z1 truss will serve as the mounting location for following truss sections and the central point for electrical power to be distributed throughout the station.

In addition to the Z1 truss, STS-92 will deliver a third Pressurized Mating Adapter that will be attached to Node 1 to provide an additional station shuttle docking port; install a Ku-band communications system on the station; and deliver control moment gyroscopes that will provide attitude control for the station following assembly flight 5A in May 1999.

In January 1999 Commander Bill Shepherd, Soyuz Commander Yuri Gidzenko and Flight Engineer Sergei Krikalev will lift off in a Soyuz rocket to begin permanent occupancy of the station.

Two months later, Joe Tanner and Carlos Noriega, along with their STS-97/ISS-4A crew mates, will arrive to conduct two space walks to install a set of solar arrays and associated equipment including two thermal control system radiators. Tanner and Noriega will make power, data and utility connections between the photovoltaic module, radiators and station and they will assist with the deployment of the arrays and radiators. In May 1999, the U.S. Laboratory Module will arrive on STS-98/ISS-5A. During that mission, astronauts Mark Lee and Tom Jones will conduct three space walks, connecting the lab to the station's cooling and power systems, assisting with the relocation of a pressurized mating adapter to allow for future

shuttle dockings and attaching space walking equipment and aids to the lab module's exterior.

The U.S. Laboratory module will be outfitted in June 1999 with the arrival of Curbeam and Hadfield on STS-99. During three space walks, they will install a UHF antenna to provide space-to-space communications for U.S.-based space walks from the space station and they will install the Canadian-built Space Station Remote Manipulating System robotic arm needed to perform assembly operations on subsequent flights. With his scheduled space walks, Hadfield will become the first Canadian to conduct a space walk.

With STS-100 in August 1999, Gernhardt and Reilly will perform three scheduled space walks to install a joint airlock that provides station-based space walking capability supporting operations conducted in both American and Russian space suits. The first space walk will be done from the shuttle airlock to make utility connections for the station airlock. The next two space walks will be from the station airlock to install space walking aids and equipment on the exterior and nitrogen tanks.

Each of the astronauts named for these flights has previous space flight experience, with the exception of Curbeam who will make his first flight in July and Reilly who will make his first flight in January 1998. Ross, Newman, Chiao, Wisoff, Tanner, Lee and Gernhardt all have performed space walks during their previous flights. The remaining astronauts, Lopez-Alegria, McArthur, Noriega, Jones, Curbeam, Reilly and Hadfield are training for their first space walks.

"The assignment of these EVA crew members is a critical element in our ability to build a space station on the ground that can be successfully assembled on orbit," said Randy Brinkley, space station program manager. "I am highly pleased with the level of expertise and dedication these crew members bring to the program."

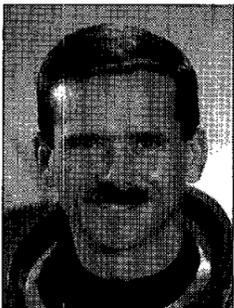
Updated information on the International Space Station and assembly sequence flights can be found at the space station home page at address: <http://station.nasa.gov> □



Ross



Chiao



Hadfield



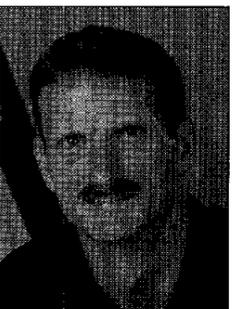
Jones



Lee



McArthur



Tanner



Newman



Gernhardt



Lopez-Alegria



Curbeam



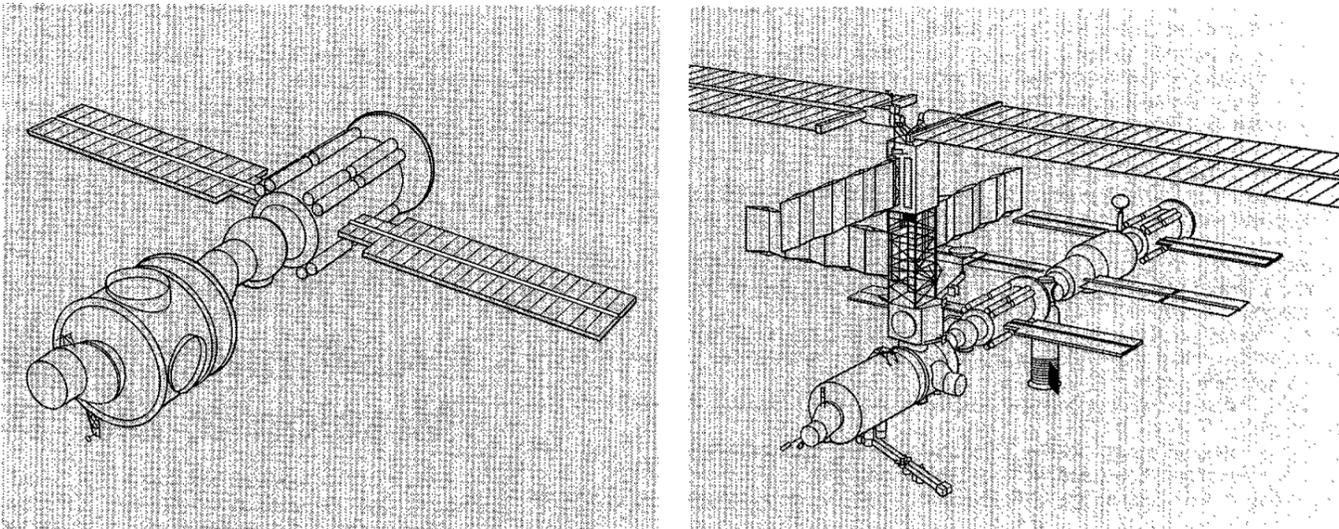
Reilly



Noriega



Wisoff



Left: American assembly flights for the International Space Station will begin with STS-88/ISS-2A, scheduled for a July 1998 launch. During their space walks, Jerry Ross and Jim Newman will connect power and data transmission cables between Node 1 and the Functional Energy Block. Right: The U.S. Laboratory module will be outfitted in June 1999 with the arrival of Curbeam and Hadfield. In three space walks, they will install a UHF antenna to provide space-to-space communications for U.S.-based space walks and install the Canadian-built Space Station Remote Manipulating System robotic arm.

Astronaut space walk assignments for assembly of space station

| Flight | Crew Members | Date | Payload |
|----------------|--|--------------|--|
| STS-88/ISS-2A | Jerry Ross; Jim Newman | July 1998 | 3 space walks; Node 1; connect power cables |
| STS-92/ISS-3A | Leroy Chiao; Jeff Wisoff; Michael Lopez-Alegria; and Bill McArthur | January 1999 | 4 space walks; Integrated Truss; Portable Mating Adapter |
| STS-97/ISS-4A | Joe Tanner; Carlos Noriega | March 1999 | 2 space walks; Photovoltaic module |
| STS-98/ISS-5A | Mark Lee; Tom Jones | May 1999 | 3 space walks; U.S. Lab Module |
| STS-99/ISS-6A | Chris Hadfield; Robert Curbeam | June 1999 | 3 space walks; Lab out-fitting; Remote Manipulating System |
| STS-100/ISS-7A | Mike Gernhardt; James Reilly | August 1999 | 3 space walks; Joint Airlock High Pressure Gas Assembly |

33 Years Ago at MSC

More than 52,000 attend space center's first open house in 1964

Reprinted from the Space News Roundup June 24, 1964.

The first public showing of the Manned Spacecraft Center was held June 6 and 7 with over 52,000 persons taking a tour of the Center, and viewing the various displays depicting the past, present and future

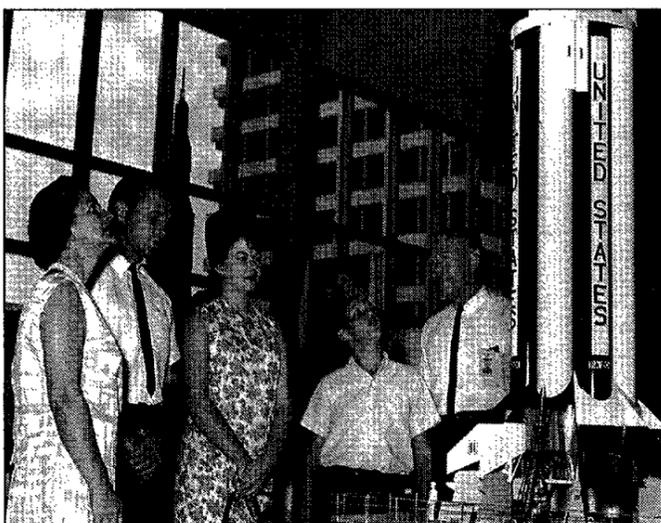
hardware of the space program.

Another 12,000 visitors toured the center the past two Sunday afternoons. The gates are open to the public from 1 - 5 p.m. each Sunday and will continue to be open until further notice.

Displays in the area between

Highway FM 528 as well as those in the lobby of the auditorium will be available for inspection by the visitors.

A movie is also shown at the 600 seat auditorium each half-hour during the hours the center is open to the public.



NASA Photos S64-26277, S64-26269, S64-26264

Left: Visitors check out a rocket model during the first open house held at the center. The capsule was a popular attraction during the open house event. Above: Visitors sit in an engine bell during open house. JSC once again will open its doors to the public Saturday, Aug. 23 (see story Page 3).

Gilruth Center News

New Hours: The Gilruth Center now will remain open until 2 p.m. Saturday and close at 9 p.m. Friday.

Sign up policy: All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a yellow EAA badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For details, call x30304.

EAA badges: Required for use of the Gilruth Center. Employees, spouses, eligible dependents, NASA retirees and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday; and 9 a.m.-2 p.m. Saturdays. Cost is \$10. Dependents must be between 16 and 23 years old.

Softball: Registration is under way for summer softball leagues. Cost is \$275 per team for competitive leagues, \$200 for recreational leagues.

Basketball: registration is under way for men's summer basketball leagues for play on Tuesday, Wednesday and Thursday evenings. Cost is \$315 per team.

NASA Fitness Challenge: runs through Aug. 31. Call x30301 for more information.

Complete Weight Control Program: starts June 24 with sessions on Monday, Wednesday and Friday. For more information call x30301 or x30302.

Hatha Yoga: A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is \$40 for eight weeks.

Nutrition intervention program: A six-week program to learn more about the role diet and nutrition play in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.

Defensive driving: One-day course is offered once a month. Next class is June 21. Pre-registration required. Cost is \$25.

Stamp club: Meets at 7 p.m. every second and fourth Monday in Rm. 216.

Weight safety: Required courses for employees wishing to use the weight room will be offered from 8-9:30 p.m. June 26 and July 17. Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. Additional family members are \$50.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido: Martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is \$35 per month. New classes begin the first of each month.

Aerobics: Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Ballroom dancing: Beginner classes meet from 7-8:15 p.m. Thursdays. Intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Fitness program: Health Related Fitness Program includes a medical screening examination and a 12-week individually prescribed exercise program. For more information call Larry Wier at x30301.

Gilruth Home Page: Check out all activities at the Gilruth online at: <http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm>

Softball leagues now forming; basketball leagues available

Registration is currently under way at the Gilruth Center for summer softball leagues and there is still room to join in summer basketball.

Softball league registration ends June 20, with the season commencing the week of June 30.

The men's B competitive will play on Tuesday and Wednesday nights; the men's C competitive on Tuesday, Wednesday and Thursday nights; mixed C recreational on Monday, Tuesday, Wednesday and Thursday nights; and the men's open double-header will play Monday nights.

The Employee Activities Association policy requires every player to have an Employees Activities Association picture badge or blue outside player badge in his or her possession at all times. NASA civil service badges will no longer be accepted for this purpose.

Only official and completed rosters will be accepted during sign-

ups. Fees are \$275 per team for competitive leagues and \$200 per team for recreational league, and are payable upon registration. Teams are required to have five or more players with Employees Activity Association badges on the field at all times. There is a 10-game minimum guarantee and there are no restrictions on individuals playing on multiple teams in different leagues. Teams may start games with eight players. Competitive leagues will be awarded T-shirts to first place teams in each league. Recreational leagues have no awards or playoffs and use only one umpire. Registration ends Friday, June 20.

There is still time to join a summer basketball league. Employees can sign up for men's B on Tuesday; men's over 35 on Wednesday or men's C on Thursday. Cost is \$315 per team.

For more information, call the Gilruth Center at x33345.

NASA night to feature 'Mission to Mir' IMAX film

Space Center Houston will host a NASA night for JSC civil service employees and their families to preview the latest IMAX film release.

Badged employees and family members may enter Space Center Houston free beginning at 5 p.m. Friday, June 27 for the first showing of "Mission to Mir." Tickets to the new IMAX film will be distributed and the film will play beginning at 6:30 p.m. and run until all NASA guests have had the opportunity to see the film.

The movie, "Mission to Mir," was produced in cooperation with the cosmonauts and astronauts who have participated in the last four missions to the Russian Mir Space Station. With a cast of 36 Russian, American and international partner space-farers, the film documents three *Atlantis*-Mir dockings and includes the first IMAX footage of a Soyuz launch.

In order to film the forty-minute feature, eight astronauts received extensive training in the use of the bulky 85 pound IMAX cameras.

"Of course in space it's zero gravity, but the camera has a lot of iner-

tia," said Astronaut Charlie Precourt. "Once we got it moving, it was a challenge to try and stop it from crashing into a wall."

"Mission to Mir" is the latest of five IMAX films produced in space. The 15/70 IMAX format uses film that is 10 times the size of the 35mm standard. IMAX films are shown in specially constructed theaters with wrap-around digital sound and oversized screens. Only 150 such theaters exist. Space Center Houston houses the largest IMAX in Texas.

The film highlights the new international partnership in space and the complexities of life in zero gravity conditions. "I think audiences will come away feeling that it is possible for people of different nationalities and cultures to live and work together on such an important venture as space exploration," said IMAX producer Toni Meyers.

Crews on Earth also filmed extensively at both JSC and the Star City cosmonaut facility, providing a unique look at Russian and American training techniques.

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Loving Feelings Concert: 8 p.m. Sept. 9 at the Summit. Tickets are \$38.

Belize trip: June 22-27. Cost is \$999 per person for divers, \$849 per person for non-divers.

Costa Rica trip: good through June 30. Cost is \$935 per person.

Houston Astros Baseball: Field box seats \$18. Astros vs. Cleveland Indians 7 p.m. July 2. Purchase tickets by June 23.

EAA cruises: Seven-day cruise to Caribbean leaving from Houston in November. Prices vary depending on cabin choices. For more information call Dick McMinimy at x34037.

Astroworld: \$22.75. Season pass \$56.75. Multi-visit \$37.50

Waterworld: \$11.50.

Moody Gardens: Tickets are \$9.50 for 2 of 4 events.

Space Center Houston: Adult \$8.95; children (4-11) \$6.40.

Seaworld: Adult \$27.25; children(3-11)\$18.25.

Schlitterbahn: Adult \$20.25; children \$17.50.

Splashtown: Adult \$14.50; children (3-9) \$11.50.

Movie discounts: General Cinema, \$5.25; AMC Theater, \$4.50; Sony Loew's Theater, \$4.75.

JSC logo shirts: Polo style, \$23. T-shirt, \$10.

Stamps: Book of 20, \$6.40.

Orbit: The book "Orbit" by Jay Apt, Mike Helfert and Justin Wilkinson is on sale for \$28.

Metro tickets: Passes, books and single tickets available.



SPACE FLIGHT AWARENESS AWARDS—Among those viewing the night launch of STS-84 from the Banana Creek Viewing Area were the 31 JSC civil service and contractor employees who were recipients of NASA's Space Flight Awareness Honoree Award. The award, one of NASA's highest tribute to government and industry workers, is given only to a select few in recognition of their dedication to quality work and flight safety. The honorees also received a VIP tour of Kennedy Space Center and were guests of honor at a reception where NASA and contractor management, as well as numerous astronauts, applauded their outstanding work and dedication to the space program. Astronaut Story Musgrave presented each honoree with a framed certificate and lapel pin at JSC's awards breakfast held during the event. Seated, left to right: Dawn Fader, Nancy Porter, Tammy Waterhouse, Irma Stanfield, Kitty Rogers, Bernie Hajek, Jan Read, Thelma Swindell, Stephanie Castro, Karen Meyers and Lou Higgins. Second row, left to right: Oleg Lvovski, Steve Campbell, Lindsay Irby, Tom Marshall, Mike Kincaid, Todd Gauer, Ernest Sanchez, Curtis Buckner, Fred Smith, Jose Garcia and Mike Cooke. Third row: Jasen Raboin, George Jarrell, Chris Popp, Damon Smith, Caasi Moore, Dave Staat, Terry Tri, Andy Titterton and John Wierzbicki.



JSC Photo S07-06338 by Steve Candler

JSC Director George Abbey presents Nilda Reyes of the Business Management Directorate the Marilyn J. Bocking Award for Secretarial Excellence.

Nilda Reyes earns top secretary honors

Nilda Reyes of the Business Management Directorate has been awarded the Marilyn J. Bocking Award for Secretarial Excellence.

Reyes was honored because of her mature administrative discipline, engaging interpersonal skills and her commitment to achieving a flawless product.

Her supervisors nominated Reyes for her superior skills and a positive attitude that have contributed to the improved functioning of the directorate.

Her commitment and dedication in handling multiple duties and managing the office of the Procurement Officer earned her JSC's top secretarial award.

People on the Move

Human Resources reports the following personnel changes as of June 3:

Additions

Keith Combs joins the Business Management Directorate as a program analyst. Richard Iark joins Flight Crew Operations as a research pilot. Santana Cruz joins Engineering as a materials and structures engineer. James Siekierski joins Engineering as a data systems engineer.

Temporaries

Sylvia Stottlemeyer joins the Human Resource Office as a secretary.

Transfers

Hal Aldridge transfers from Langley Research Center to the Engineering Directorate as an electrical engineer.

Reassignments

Mark McDonald moves from the Space Station Program Office to Engineering as an aerospace engineer. Michael Rouen moves from the EVA Project Office to Engineering as an environmental engineer. Dianne Flowers moves from the Business Management Directorate to the Office of the Chief Financial Officer as a program analyst. David Moyer moves from Mission Operations to the Space Shuttle Program Office as an aerospace engineering manager. Cheevon Lau moves from the Space Station Program Office to Space Operations as an aerospace engineering manager.

Promotions

Linda Chauvin was promoted as a secretary in the Office of the Director. Vanessa Beene was promoted to contract specialist in the Business Management Directorate. Georgia Piwonka was promoted to administrative assistant in Mission Operations.

Resignations

Jerome Apt from Flight Crew Operations. Susan Blevins from the Space Station Program Office.

Retirements

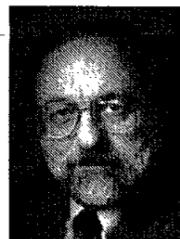
Carol Homan, Business Management Directorate, 25 years; Thomas Briant, Mission Operations, 34 years; Patricia Hall Space Shuttle Program Office, 30 years; Clay McCullough, Space Shuttle Program Office, 34 years.

Rummel gets new assignment

John Rummel is now acting director of the Space and Life Sciences Directorate.

Rummel, who was associate director, replaces David Short who returned to private practice.

Rummel joined JSC in 1966 as a physiologist and has held progressively responsible positions in the Space and Life Sciences Directorate; including



Rummel

manager in the Mission Management Office; mission scientist; assistant to the director for Science Payloads; manager of the Program Integration Office; and assistant to the director for Science Payloads. Since June 1995, Rummel has served as acting deputy director, acting director and associate director for Space and Life Sciences.

NASA offers fellowship program for senior managers

JSC employees—primarily in the grade 13 to Senior Executive Service levels—are invited to apply for spots in academically based programs of study in management and executive processes.

The programs are at universities such as Harvard, the Massachusetts Institute of Technology, Carnegie-Mellon and Simmons.

The rating criteria used by Headquarters and JSC for selection are the candidate's job performance, education record, development record, significant recognition and accomplishments, purpose for participating in the program and supervisor and management endorsements.

Employees interested in being nominated

for any of these programs must first talk to their supervisor. Nominations are worked through each directorate or program office and are due to the Human Resources Development Branch by Tuesday, July 1. JSC nominees will be chosen by JSC Director George Abbey and final selections will be made at NASA Headquarters. Final selections

also will be based on the needs of the center and the match of individual needs with the program objectives.

Each director or program manager and directorate-level training coordinator has a more detailed description of the programs that are available. For more information call Erica Vandersand at x31999.

Dates & Data

June 21

NTA meets: The National Technical Association will meet at 10 a.m. June 21 at Texas Southern University School of Technology, Rm. 316. For more information call Pam Denkins at x35272.

Sailing courses: The NASA Sailing Club, the Clear Lake Sailing Club and the Lido Fleet is offering a basic and intermediate sailing courses. Free to club members. \$20 per person for non club members. For reservations call Richard Hoover. (281) 916-7716.

June 25

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. every Wednesday at the House of Prayer Lutheran Church. For more information, call Jeannette Darcy at x45752.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. every Wednesday at

Lockheed Martin, 555 Forge River Road. For more information, contact Richard Lehman at (281) 538-1854.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. every Wednesday at United Space Alliance, 600 Gemini. For details, call Pat Blackwell at (281) 282-4302, or Ben Black at (281) 282-4166.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon June 25 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, contact Al Jackson at x35037.

June 26

Radio club meets: The JSC Amateur Radio Club will meet at 7 p.m. June 26 at Piccadilly Cafeteria, 2465 Bay Area Blvd. For more information call Larry Dietrich at 39198.

June 27

IMAX film: Space Center Houston will host a NASA night beginning at

5 p.m. June 27. Civil servants and their families can view the new IMAX film "Mission to Mir" free. For details call SCH at (281) 244-2105.

July 2

Crew briefing: The STS-84 crew will share flight memories at 1:30 p.m. July 2 in Teague Auditorium. For more information call Helen Harris at x38413.

July 3

Warning system test: The site-wide Employee Warning System will undergo its monthly audio test at noon July 3. For more information call Bob Gaffney at x34249.

July 8

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. July 8 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

July 9

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. July 9 in the Bldg. 3 cafeteria. For details call G.D. Valle at x38835.

PSI meets: The Clear Lake/NASA Chapter of Professional Secretaries International will meet at 5:30 p.m. July 9 at the Holiday Inn, NASA Road 1. Dinner costs \$15. For details call Elaine Kemp at x30556.

July 10

Airplane club meets: The Radio Control Airplane Club will meet at 7:30 p.m. July 10 at Clear Lake Park Community Bldg. For more information call Bill Langdoc at x35970.

July 11

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. July 11 at the Lunar and Planetary Institute, 3600 Bay Area Blvd. For more information call Chuck Shaw at x35416.

July 12

Lunar Rendezvous Run: Lockheed Martin will sponsor the 19th annual Lunar Rendezvous Run July 12 at the Gilruth Center. The event will consist of a 5K race and a 5K walk. Entry fee is \$13 if application is postmarked by July 5; \$18 after that. Applications are available at the Gilruth Center. For details call Willie Vanderbrink (281) 470-6715.

July 16

Scuba club meets: The Lunarfins will meet at 7:30 p.m. July 16 at Redfish Restaurant under the Kemah/Seabrook bridge, Seabrook side. For details call Fred Toole at x33201.

Sept. 8

Thermal and Fluids workshop: The Engineering Directorate will host the eighth annual Thermal and Fluid Analysis Workshop from Sept. 8-13 at the University of Houston Clear Lake. For details call Carlos Ortiz at x38879.

News Briefs

NASA names new science head

Arnauld Nicogossian has been named associate administrator for NASA's Office of Life and Microgravity Sciences and Applications by NASA Administrator Daniel S. Goldin. Nicogossian manages a national and international program in research and development. Focus areas include life sciences, life support technology, biotechnology, materials sciences, aerospace medicine, occupational health and commercial programs.

Prototype rover completes Mars trek

NASA's newest, six-wheeled prototype Martian rover—nicknamed Rocky 7—has successfully passed its most rigorous field test yet, traveling six-tenths of a mile over rugged, Mars-like terrain, while conducting science experiments and snapping 580 photographs along the way. The week-long series of field tests, carried out May 23-30 at Latic Lake, an ancient lake bed about 175 miles east of Los Angeles, was designed to simulate several weeks of a real Mars rover mission and to test the rover's ability to drive much greater distances than current rovers. In addition, Rocky 7 conducted five simulated science experiments in real-time and collected samples of soil and rocks that would be retrieved and returned to Earth by a later Mars mission.

Hubble first to spot colliding supernovas

Astronomers using the Hubble Space Telescope have taken the first images clearly showing interactions between two or more exploding stars, called supernova, which are producing a tremendous display in a galaxy 17 million light years from Earth. Debris speeding out from the supernova is slamming together in a cosmic collision, the likes of which have never before been seen.

NASA joins fight against diabetes

NASA's Office of Life and Microgravity Sciences and Applications and the Juvenile Diabetes Foundation are embarking on a cooperative partnership to conduct research that addresses the treatment and monitoring of diabetes and diabetes-related problems. The two parties signed a Space Act Agreement June 8 enabling NASA and the Foundation to initiate joint research activities that will build on the strengths of the two organizations and support their respective goals.

Electronic mail adjustment mostly transparent

Electronic mail users and the people with whom they correspond probably began noticing changes last week, but most employees won't be able to detect any difference in their day-to-day activities.

JSC's Information Services Directorate has adjusted the Microsoft Exchange mail system so that it will send out everyone's "generic" electronic mail address.

JSC Postmaster Jennifer Rasnic said the change synchronizes the Exchange mail system with the X.500 directory service at the center. That directory service maintains all of the "aliases" that hide the complexities of addressing messages and make the system easier to use.

The change will make additional identifying information readily available to those addressing messages so they can be sure they are sending to the right JSC employee. Exchange users should be able to look at the "Properties" of the address and see the person's courtesy titles, generational qualifiers, building, room, phone number and organization code.

The change also affects the E-mail address that is sent out when anyone sends mail across the Internet. Previously, the mail system appended an address that looks like username@ems.jsc.nasa.gov whenever someone sends a message to someone else. Now, the system

appends a generic, X.500 address that looks like firstname.mi.lastname#@jsc.nasa.gov

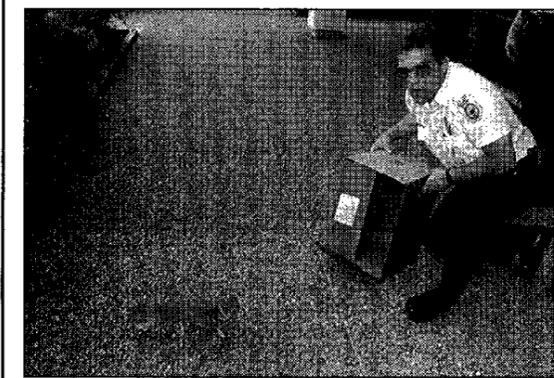
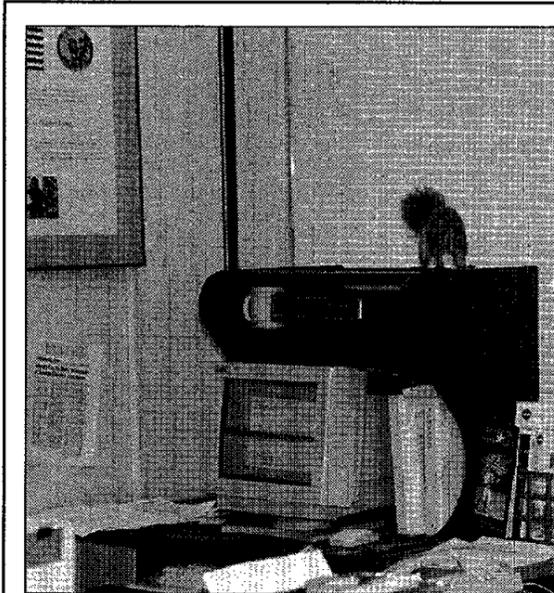
For example, Rasnic's address will change from: jrasnic@ems.jsc.nasa.gov to jennifer.y.rasnic1@jsc.nasa.gov

Exchange users will notice that names in the global address list will be in all capitals, but otherwise everything is expected to be transparent. A small percentage of users may have to adjust entries in their personal address books or distribution lists. A few others may need to resubscribe to things like automated electronic mail lists.

Exchange users who have saved JSC Exchange or Microsoft Mail

addresses to their Personal Address Books must delete those addresses. Mail won't be delivered to Personal Distribution Lists that used Personal Address Book with the address format jrasnic@ems.jsc.nasa.gov.

Rasnic said the best thing to do is to act as if nothing has changed. Users who are affected should watch for mail that is returned as undeliverable or regular automated E-mail messages that don't appear as expected. If they notice either of these, they should write down the exact message that appears on the screen and contact the Help Desk at x34800 or forward the message to the Help Desk (ITOC) address in the global address list.



JSC Photos 97-07091, 97-07093, 97-07092 by Karen Schmidt

UNWELCOME GUEST—JSC security and maintenance workers eject a squirrel from Bldg. 2. Clockwise from top left are 1) The squirrel sits atop a computer desk. 2) JSC Security Officers Leroy Lance, Stanley Harrell and Lindon Smith scramble to help maintenance worker Sinh Nguyen capture the unwanted guest. 3) Smith releases the squirrel. Nancy Robertson, chief of Public Affairs' Education and Information Services Branch, opened her office door on a recent Monday to discover her office had been vandalized over the weekend. Unsure if the vandal was animal or human, she called security to report the incident. Smith, Lance and Harrell responded to the call. During the report, the officers began looking around the office for clues only to discover a squirrel hiding in a television cabinet. The officers tried to capture the animal but were unsuccessful. A call was made to work control and Nguyen was sent to remove the squirrel. Together Nguyen and the officers captured the unwelcome guest and released him.

KSC payload, shuttle teams work to speed processing

(Continued from Page 1)

formance monitor provides a gross indication of fuel cell health, which caused the team to assume the worst in the case of STS-83.

As with all hardware issues on the shuttle, fuel cell anomalies are taken seriously and reviewed extensively prior to clearing future missions for launch. Additionally, the flight rules are being reviewed to ensure that proper insight is provided to flight controllers in making decisions on the health of the fuel cells.

Columbia launched on April 4 and landed in Florida on April 8 without completing the mission's science objectives. About two weeks later, shuttle program managers decided to refly the Microgravity Science Laboratory mission on STS-94 as soon as possible within safety guidelines.

"This decision demonstrated the shuttle program's confidence in the KSC processing team," said Bob Sieck, director of shuttle processing. "Special credit goes to the workers

in Orbiter Processing Facility Bay 1. They produced a quality product in record time."

When marching orders were given, NASA's shuttle and payload communities teamed up to give *Columbia* and the Spacelab payload a speedy turnaround. Once in the Orbiter Processing Facility, replacement of the suspect fuel cell was the first order of business and that was completed the week after landing. Managers then put into motion a strategy that minimized the amount of rework performed on the shuttle and reduced the time required to service the payload.

The ambitious schedule required that all experiment servicing be done while the Spacelab remained in the shuttle's payload bay. Between flights, Spacelab is normally removed and then transported to the Operations and Checkout Bldg. for rework in a spacious environment. Payload technicians overcame the shuttle's cramped conditions and successfully completed

many critical tasks such as replenishing the flammable fluids of a combustion experiment.

"This is the first time that a payload has remained in an orbiter between flights," said Payload Manager Scott Higginbotham. "We are excited about having accomplished something that has never been tried before."

Working side-by-side with the payload team, shuttle technicians and managers faced some challenges of their own. Normally an orbiter visits the Orbiter Processing Facility for about 85 days in preparation for its next launch, but this reflight called for about 56 days in the facility. Managers saved some time by deferring certain routine structural inspections until *Columbia's* next mission, but other work could not wait and had to be accomplished before launch.

For example, the shuttle's forward reaction control system, located in the nose of the vehicle, had to be removed with three out of sixteen

steering thrusters requiring replacement. Also, two of the three 85-pound auxiliary power units that provide hydraulic power to *Columbia's* flight control systems were replaced having reached their run-time limit between overhauls.

An important part of this time-saving strategy was to minimize the burden on the shuttle processing team.

"Most of the time savings in the OPF was the result of a concerted planning effort between NASA and our contractor partners," said Grant Cates, NASA flow director for *Columbia*. "Once the plan was in place, the team approached this challenge in much the same way that they approach every flow."

To further speed up *Columbia's* processing for reflight, managers took one main engine scheduled to fly on *Atlantis* in September and two engines from *Columbia's* November flight. The external fuel tank and solid rocket boosters being used on STS-94 were originally slated for mission STS-85.



The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees. Deadline for the submission of articles is Friday, three weeks before the desired date of publication.

The Roundup office is in Bldg. 2, Rm. 181. The mail code is AP2. The main Roundup telephone number is x38648, and the fax number is x45165. Electronic mail messages may be directed to kelly.o.humphries1@jsc.nasa.gov or karen.r.schmidt@jsc.nasa.gov.

Editor Kelly Humphries
Managing Editor ... Karen Schmidt

Shriver, McMonagle eye shuttle; Harbaugh works space walks

(Continued from Page 1)

Harbaugh has extensive background in space walking, having done so during two different shuttle missions, STS-54 and STS-82. Prior to his most recent flight, Harbaugh trained as the backup space walk astronaut for the first servicing mission to the Hubble Space Telescope in 1993.

McMonagle and Harbaugh flew together on STS-39 and STS-54. McMonagle was commander of his third mission, STS-66. Harbaugh also flew on STS-71, the first mission to dock with the Russian Mir

Space Station and most recently on the second servicing mission to Hubble, STS-82, in February.

Shriver, a former astronaut, will take over the duties of deputy director of Kennedy Space Center's Launch and Payload Processing, on Aug. 15, but will begin assuming duties of his new position while assuring a smooth transition of his previous duties to his successor.

"With the addition of Loren Shriver to our existing senior staff, I think we have assembled an outstanding management team," said KSC Director Roy Bridges. "Their chal-

lenge will be to meet the needs of the agency during the coming years of processing and launching the International Space Station, while preparing the center to help attain the next goals when humankind will learn to work and explore beyond low-Earth orbit."

Shriver will provide executive leadership, strategic planning and direction for KSC's agency-assigned responsibilities as the Center of Excellence for Launch and Payload Processing Systems. This includes payload carriers, space shuttle processing and

launch, and processing of payloads including International Space Station elements and responsibilities assigned to the center for expendable launch vehicles.

Shriver has served as launch integration manager since May 1993. A graduate of the Air Force Academy, he participated in development test and evaluation of the F-15 fighter aircraft and the T-38 lead-in fighter. Selected by NASA as an astronaut-candidate in January 1978, Shriver flew three shuttle missions, as pilot of STS-51C and as commander of STS-31 and STS-46.